Dr. Eva C. Herbst

Postdoctoral Fellow in Shoulder Biomechanics

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Website - **Github** - **GoogleScholar** - **Figshare** - **Publons** - **Orcid**

Education

Oct 2016 - Apr 2020	PhD in Biomechanics and Palaeontology *Advisor: John Hutchinson, Structure & Motion Lab, Royal Veterinary College, London*
Aug 2012 - May 2016	B.A. in Integrative Biology *U.C. Berkeley*
Oct 2013 - Jun 2014	Certificate of Higher Education in Biomedical Sciences *Durham University, Year of Study Abroad*

Employment & Research Experience

Mar 2023 - present	Postdoctoral Fellow: Patient Specific Computational Shoulder Biomechanics *ETH & Schulthess Clinic, Zurich*
Dec 2019 - Nov 2022	Postdoctoral Researcher: Skull Biomechanics of Triassic Reptiles *Palaeontological Institute & Museum, University of Zurich*
Oct 2019 - Dec 2019	OATech+ Network Early Career Researcher Placement: Knee Osteoarthritis *Skeletal Biology Group, Royal Veterinary College London*
May 2013 - Jul 2016	Undergraduate Research Assistant: Anatomy and Biomechanics Projects *U.C. Berkeley & University of Missouri*

Technical Skills

- **biomechanical model development**: specializing in dynamically coupled finite element and multibody dynamic analyses
- **in vivo kinematic analysis:** biplanar fluoroscopy
- **ex vivo kinematic analysis:** cadaveric analysis with optical motion capture
- **programs and languages**: Artisynth, Blender, 3D Slicer, Avizo, Mimics, Abaqus, Maya, Python, Java, R
- **additional skills**: dissections, image segmentation, photogrammetry, 3D modeling

Honors & Awards

2021	**D. Dwight Davis Award, Society of Integrative and Comparative Morphology** Best student oral presentation in the Division of Vertebrate Morphology
2020	**Swiss Commission of Palaeontology Prize** Best presentation in palaeontology given at the Swiss Geoscience Meeting
2016	**Franklin M. Henry Award, Integrative Biology, UC Berkeley** Outstanding achievement in human performance and health research
2013 - 2016	**Dean's Honors (2013,2015) & Distinction in General Scholarship (2016), UC Berkeley**

Grants & Funding

2024	**ETH Career Seed Award** "Age-based Bone Density of the Glenoid: Method Development & Quantification of Patient Variation", Role: PI, project conceptualization, application, supervision	30,000 CHF
2024	**Gesellschaft für Arthroskopie und Gelenkchirugie** Grant for establishing a clinical imaging database of shoulder instability Patients, Role: grant application, project planning and implementation	10,000 EUR
2024	**Hamlyn Symposium for Medical Robotics Workshop Funding** Organisation of Workshop: Open-Source Software for Surgical Technologies, London, June 2024	2,500 GBP
2023	**Digital Switzerland Boost Programme** Grant for attending Advanced 3D Slicer Programming Course	420 CHF
2021	**ImagingBioPro Network Online Educational Material Grant** Development of educational materials and code: mesh manipulation and trabecular segmentation	1,000 GBP
2020	**University of Zurich GRC Grant** Organization of finite element analysis conference (› 200 participants), resource platform development	10,000 CHF
2019	**OATech+ Network Biomechanics and Mechanobiology Pump Priming Fund** Research project: 3D trabecular architecture as a biomarker to identify and monitor knee osteoarthritis (role: grant application, project coordination and execution)	10,000 GBP
2019	**OATech+ Network Early Career Researcher Placement** Placement with Prof Andrew Pitsillides at RVC to work on osteoarthritis project (see above)	3,000 GBP
2018 2019	**Royal Veterinary College Foreign Travel Fund** 300 GBP each to present research at ICVM and SICB conferences	600 GBP
2016	**Research Experience for Undergraduates, National Science Foundation** Biomechanics research internship, University of Missouri	3,500 USD

Publications, Presentations

- 16 peer-reviewed papers (8 first author), 34 conference presentations (19 presenting author)
- Further information on invited talks, workshops, and lectures here.

Teaching

Teaching

- **Lecture for Master's Course "Clinical Challenges in Musculoskeletal Disorders":** *Current Research in Shoulder Biomechanics*. ETH. 2024 + 2025
- **Lectures Bio 262 & 267:** *Using Computer Tools to Investigate Biomechanics of Animals*. University of Zurich. 2020-2022.
- **Bio 262: Evolutionary Morphology of Vertebrates: Issues and Methods**. Role: leading and designing anatomy practicals. University of Zurich. 2021,2022
- **Bio 267:, Paleobiology and Evolution of Vertebrates**. Role: leading and designing anatomy practicals. University of Zurich. 2021,2022
- **Comparative Animal Locomotion Course**. Role: leading research paper seminar. Royal Veterinary College, London. 2017, 2018.

Supervision

- **Max Modelhart**, *Medical PhD on glenohumeral joint morphology (official title to be determined)*, Paracelsus Medical University (PMU), Salzburg, Austria (Co-supervisor, Ongoing)

- **Anna Luong**, Master's Thesis: *Development and analysis of personalized glenohumeral joint contact mechanics in healthy subjects*, ETH Zurich (Ongoing)
- **Liam Roth**, Master's Semester Project: *Cartilage morphology effects in patient specific biomechanical finite element glenohumeral joint models*, ETH Zurich (2024)
- **Jan Heres**, Master's Thesis: *Reconstruction of a patient-specific model of the humerus bone*. University of West Bohemia (acting as external supervisor) (2024)
- **Dennis Agbanyim**, Master's Thesis: *Phantomless bone density calculation: developing research software for patient-specific shoulder modeling*, ETH Zurich (2024)
- **Flavia Stettler**, Semester Project: *In vivo glenohumeral translations*, ETH Zurich (2024)
- **Dylan Bastiaans**, PhD Thesis: *Thalattosauriform digital functional anatomy*, UZH (2023)
- **Kehan Pan**, Semester Project: *Skull finite element analysis of Askeptosaurus*, ETH Zurich (2022)

Open Source Work

Methods & Code	• Python-based Blender plugin for modelling 3D muscles • method for visualizing joint range of motion • method for trabecular bone segmentation, plugin ft. on official Avizo website • Blender remeshing guide for FEA
FEZ initiative	Finite element resource development and dissemination Finite Element Zurich
CT data & 3D models	available on Figshare

Professional Service & Leadership

2025	Track Chair (Shoulder), European Society of Biomechanics
2024	Organized Workshop "Open-Source Software for Surgical Technologies" at Hamlyn Symposium for Medical Robotics
2020	Organized Finite Element Analysis Conference and Workshop (200+ participants)
2018	Session Chair, Society of Integrative and Comparative Biology Annual Meeting, San Francisco.
Peer Review	PNAS, Clinical Biomechanics, Journal of Biomechanics, The Anatomical Record, Journal of Anatomy, Integrative Organismal Biology, Methods in Ecology and Evolution Integrative and Comparative Biology, Canadian Journal of Earth Sciences

Professional Development & Certificates

2023	Advanced 3D Slicer Course: Scripting and Customization, Kitware
2022	Good Clinical Practice Module 1 and certification
2022	Data Analysis for Medical Research using R, UZH
2021	Scientific Programming with Python, Physics Department, UZH
2020	Open Life Science Course
2020	SlicerMorph 3D Morphometrics Course
2019	Avizo Course, 3DMAGINATION Ltd.
2018	MatLab Fundamentals Course
2017	Teaching and Learning in Higher Education Certificate, Royal Veterinary College, London

Languages

English:	fluent
German:	fluent